



City of Newport Beach

2013 Drinking Water Quality Report on Public Health Goals

Prepared by: Gary Tegel, Water Quality Coordinator, City of Newport Beach, June 2013

Background:

California Health and Safety Code §116470 specifies that water utilities larger than 10,000 connections prepare a special report by July 1, 2013, if the agency's water quality measurements have exceeded any Public Health Goals (PHGs). PHGs are non-enforceable goals established by the Cal-EPA's Office of Environmental Health Hazard Assessment (OEHHA). The law also requires that where OEHHA has not adopted a PHG for an element, the water suppliers are to use the Maximum Contaminant Level Goals (MCLGs) adopted by the United States Environmental Protection Agency (USEPA). Only elements which have a California primary drinking water standard and for which either a PHG or MCLG has been set are to be addressed.

If an element was detected in the City's water supply between 2010 and 2012 at a level exceeding an applicable PHG or MCLG, this report provides the information required by law. Included in this report is the numerical public health risk associated with the Maximum Contaminant Level (MCL) and the PHG or MCLG, the category or type of risk to health that could be associated with each element. Additionally, the report includes the best treatment technology available that could be used to reduce the element level, and an estimate of the cost to install that treatment if it is appropriate and feasible.

The drinking water quality of the City of Newport Beach meets all California Department of Public Health (CDPH) and United States Environmental Protection Agency (USEPA) drinking water standards set to protect public health.

CDPH establishes health standards referred to as Maximum Contaminant Levels (MCLs). Water that has elements at a level below an MCL is safe to drink even if some levels exceed a PHG or MCLG. No elements in the drinking water provided by the City of Newport Beach exceed a MCL.

A PHG represents a health protective level for an element that CDPH and California's public water systems should strive to achieve if it is feasible to do so. However, a PHG is not a boundary line between a "safe" and "dangerous" level of an element, and drinking water is acceptable for public consumption even if it contains elements at levels exceeding the PHG or MCLG.

What are Public Health Goals (PHGs)?

PHGs are set by Cal-EPA's Office of Environmental Health Hazard Assessment (OEHHA) and are based solely on public health risk considerations. These factors include analytical detection capability, available treatment technology, benefits and costs. None of the practical risk management factors that are considered by the USEPA or the California Department of Public Health (CDPH) in setting drinking water standards (MCLs) are considered in setting the PHGs. The PHGs are not enforceable and are not required to be met by any public water system. MCLGs are the federal equivalent to PHGs.

Water Quality Data Considered:

All of the water quality data collected by our water system between 2010 and 2012 for purposes of determining compliance with drinking water standards was considered. This data was all summarized in our 2010, 2011, and 2012 Annual Consumer Confidence Reports, which are mailed to all of our customers annually by July 1.

Guidelines Followed:

The Association of California Water Agencies (ACWA) formed a committee that established guidelines for water utilities to use in preparing these required reports. The ACWA guidelines were used in the preparation of this report. No guidance was available from state regulatory agencies.

Best Available Treatment Technology and Cost Estimates:

Both the USEPA and CDPH adopted what are known as Best Available Technologies, which are the best-known methods of reducing contaminant levels. The estimated costs included in this report were obtained from ACWA, various reports, and studies. Exact cost of treatment would require further analytical analysis of the water and a study of the size and sophistication of the treatment facility needed.

Many PHGs and MCLGs are set much lower than the MCL; it is not always possible or feasible to determine what treatment is needed to further reduce an element downward. Many PHGs and/or MCLGs are set at zero. Estimating the costs to reduce an element to zero is difficult, if not impossible, because it is not possible to verify by analytical means that the level has been lowered to zero. In some cases, installing treatment to try and further reduce very low levels of one element may have adverse effects on other aspects of water quality.

Elements Detected That Exceed a PHG or a MCLG:

The following is a discussion of elements that were detected in one or more of our drinking water sources at levels above the PHG, or if no PHG, above the MCLG.

Coliform Bacteria:

Coliform bacteria are indicator organisms in nature that are everywhere and are not generally considered harmful. Coliforms are used because of the ease in monitoring and analysis. If a positive sample is found, it indicates a potential problem that needs to be investigated. It is not unusual for a system to have an occasional positive sample. It is difficult, if not impossible; to assure that a system will never get a positive sample. In all cases when a positive sample is detected, it is our practice to notify CDPH and take immediate action.

The reason for the coliform drinking water standard is to minimize the possibility of the water containing pathogens, which are organisms that cause waterborne disease. Because coliform is only a surrogate indicator of the potential presence of pathogens, it is not possible to state a specific numerical health risk. While USEPA normally sets MCLGs at a level where no known or anticipated adverse effects on persons would occur, they indicate that they cannot do so with coliform bacteria.

The City uses a contract laboratory to collect and process our bacteriological samples. During 2010, 2011, and 2012, they collected over 4,698 samples for coliform analysis. CDPH sets the standards for bacteriological testing and re-sampling. The City submits all water quality results to CDPH for review.

On two occasions, the City had positive coliform bacteria results between 2010 and 2012. All were negative for fecal coliform. At one location (one positive sample), it was determined the sample may have been contaminated by nearby vegetation. At the other site (four positive samples), it was determined that a new service line had not been properly flushed when the City's contractor installed the line. The MCL for coliform bacteria is a maximum of five percent positive samples for all samples taken in a water system per month. The MCLG is zero. The site with four positive samples is recorded as the highest monthly amount equating to four samples out of 162 samples taken or 2.47%.

The City adds chloramines (a mixture of chlorine and ammonia) at our sources to assure that the water served is microbiologically safe. The chloramine residual levels are carefully controlled to provide the best health protection without causing the water to have undesirable taste and odor or increasing the disinfection byproduct level. This careful balance of treatment processes is essential to continue supplying our customers with safe drinking water.

Other equally important measures that have been implemented include a cross-connection control program, maintenance of a disinfectant residual throughout our system, a monitoring and surveillance program and maintaining positive pressures in our distribution system. Our system has already taken all of the steps described by CDPH as "best available technology" for coliform bacteria.

Arsenic:

Arsenic is an element that occurs in the earth's crust. Accordingly, there are natural sources of exposure. Exposure to arsenic at high levels can pose serious health effects, as it is known to cause skin cancer and other cancers of the internal organs. In addition, it has been reported to affect the vascular system and has been associated with the development of diabetes.

USEPA established a MCL for arsenic of 50 parts per billion (ppb) in 1975. (One ppb corresponds to about one minute in 2,000 years or a single penny in \$10,000,000). In January 2002, USEPA adopted a new standard for arsenic in drinking water that requires water suppliers to reduce arsenic to 10 ppb by January 2006. Arsenic levels between 2010 and 2012 range between "non-detect" to 2.7 ppb in the City's well water sources. The PHG for Arsenic is 0.004 ppb.

The Best Available Technologies treatment for Arsenic to lower the level for high capacity sources is Reverse Osmosis. Since the level of Arsenic in each of the City wells is already below the MCL, Reverse Osmosis would be used to lower the Arsenic level below the PHG. The

cost estimate provided by ACWA for the volume of water the City would need to treat, is \$21,110,192, which includes capital, operations and maintenance costs. This would result in an estimated annual cost to each service connection of \$812 per year.

Uranium:

Uranium is a naturally occurring metallic element which is weakly radioactive and is present in the earth's crust. Uranium in ground water is due to its natural occurrence in geological formations. High levels of uranium in water may increase the risk of cancer and kidney damage. Most of the uranium ingested by the human body is excreted, but some amounts are absorbed into the bloodstream and kidneys. Uranium decreases the kidneys' ability to filter toxins from the bloodstream. Uranium levels between 2010 and 2012 range between 1.39 and 10.20 pCi/L in the City's well water sources. The PHG for Uranium is 0.43 picoCuries per liter (pCi/l) and the MCL is 20 pCi/l.

The Best Available Technologies treatment for Uranium to lower the level for high capacity sources is Ion Exchange. Since the level of Uranium in each of the City wells is already below the MCL, the Ion Exchanged/Water Softening treatment method would be used to lower the Uranium level below the PHG. The cost estimate provided by ACWA for the volume of water the City would need to treat is \$2,531,855, which includes capital, operations and maintenance costs. This would result in an estimated annual cost to each service connection of \$98 per year.

Gross Alpha:

Gross Alpha is the measurement of radioactive particle activity for a group of radio-nuclides which include: Uranium, Combined Radium, and Radon. CDPH has established the MCL for Gross Alpha as 15 pCi/L (excluding Uranium and Radon), which is used as a screening standard to determine if further radionuclide monitoring is necessary.

There is not a PHG set by OEHHA, but the USEPA has an MCLG for Gross Alpha of zero. We have detected Gross Alpha in some of our wells at levels up to 9.68 pCi/L. However, the level of Gross Alpha detected is mainly contributed to the Uranium content. After the Uranium content is deducted, the net Alpha is less than the minimum detectable level for regulatory reporting. Therefore, no health risks or estimates of treatment are included in this report.

Lead:

There are two categories of health risk associated with lead - chronic toxicity (neurobehavioral effects in children, hypertension in adults) and cancer. The health risk of ingesting drinking water with lead above the PHG is two theoretical cancer cases in one million people drinking two liters of water a day for 70 years.

Lead is not present in our water sources, but can leach into drinking water through the resident's plumbing systems and faucets. Every three years a set of special samples are collected. The samples collected are first-draw at the residential tap of thirty or more homes identified as high-risk (new plumbing installed with lead solder before it was banned).

There are no MCLs for lead. The PHG for lead is 0.2 ppb and the Action level is 15 ppb. Test results are determined by the 90th percentile (meaning 90% of the samples were lower) of all samples collected. The highest 90th percentile level was 1.3 ppb in 2012, which is above the PHG and below the Action level.

The Best Available Technology is “Optimized Corrosion Control” for reducing lead levels. Since the City meets the “optimized corrosion control” requirements, it is not prudent to initiate additional corrosion control treatment as it involves the addition of other chemicals and there could be additional water quality issues raised. Therefore, no estimate of cost has been included.

Summary Table

Element	PHG/MCLG	Actual	MCL/Action Level
Coliform	0	4/162 or 2.47%	<5% per month
Arsenic	.004 ppb	ND-2.7 ppb	10 ppb
Uranium	0.43 pCi/l	1.39 to 10.20 pCi/l	20 pCi/l
Gross Alpha	0	ND to 9.68 pCi/l	15 pCi/l
Lead	0.2 ppb	(90%) 1.3 ppb	15 ppb

Recommendations for further action:

The drinking water quality of the City of Newport Beach meets all California Department of Public Health and USEPA drinking water standards set to protect public health. To further reduce the levels of the elements identified in this report that are already below the health-based MCL established to provide “safe drinking water”, additional costly treatment processes would be required. The effectiveness of the treatment processes to provide any significant reductions in element levels at these already low values is uncertain. The health protection benefits of these further hypothetical reductions are not at all clear and may not be quantifiable. Therefore, no action is proposed.